a flat plate dielectric material shower plate, which is formed of a material which passes a microwave therethrough substantially without a loss, being provided between the dielectric material plate and plasma excited in the chamber;

a plurality of gas discharge holes being formed in the dielectric material shower plate so that at least a part of the gas supplied by the gas supply system is discharged through the plurality of gas discharge holes through a gap between the dielectric material plate and the dielectric material shower plate;

a flat plate slot antenna being provided on an outer side of the chamber with the dielectric material plate interposed therebetween so as to supply a microwave for exciting plasma through the dielectric material plate;

an electrode being provided on an inner side of the chamber so as to hold the substrate to be processed;

a lattice-like shower head provided between the dielectric material shower plate and the substrate to be processed so as to discharge a gas, which has a composition different from that of the gas discharged from the dielectric material shower plate, to a side of the substrate to be processed; and

at least a part of the gas discharged from the dielectric material shower plate flows to the side of the substrate to be processed by being passed through an opening part of the lattice-like shower head,

wherein said lattice-like shower head is formed of a metal pipe comprising a plurality of gas discharge holes configured and arranged such that a normal to each of said holes is oblique to the surface of the substrate and each of said holes is formed on a curved surface of said metal pipe.

See the attached Appendix for the changes made to effect the above claim(s).